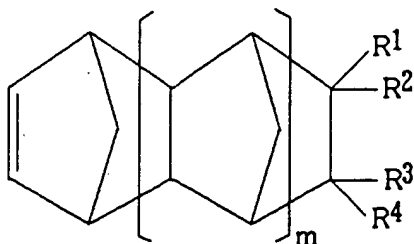···· (1-1)

in which m is an integer of 0 to 2, R^1 to R^4 denote each,
independently of each other, an atom or a residue selected from
the group consisting of hydrogen atom, halogen atoms and
hydrocarbon residues which may have double bond, wherein R^1 to R^4
may be fused together to form a mono- or polycyclic ring which
may have double bond or wherein an alkylidene radical may be
formed from the pair of R^1 and R^2 or R^3 and R^4 or, further, R^1 and
R^3 or R^2 and R^4 may be fused together so as to form a double bond,
with the proviso that at least one of R^1 to R^4 stands for an
unsaturated hydrocarbon residue having at least one double bond,
in case the mono- or polycyclic ring formed from R^1 to R^4 by
being fused together has no double bond, in case the pair of R^1
and R^2 or R^3 and R^4 does not form an alkylidene radical and in
case R^1 and R^3 or R^2 and R^4 are not fused together to form an
endocyclic double bond.

18. (New) The random copolymer as claimed in claim 2,
wherein the non-conjugated cyclic polyene (A2) is that
represented by the formula (1-1) given below:

···· (1-1)

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in which m is an integer of 0 to 2, R^1 to R^4 denote each,
independently of each other, an atom or a residue selected from
the group consisting of hydrogen atom, halogen atoms and
hydrocarbon residues which may have double bond, wherein R^1 to R^4
may be fused together to form a mono- or polycyclic ring which
may have double bond or wherein an alkylidene radical may be
formed from the pair of R^1 and R^2 or R^3 and R^4 or, further, R^1 and
R^3 or R^2 and R^4 may be fused together so as to form a double bond,
with the proviso that at least one of R^1 to R^4 stands for an
unsaturated hydrocarbon residue having at least one double bond,
in case the mono- or polycyclic ring formed from R^1 to R^4 by
being fused together has no double bond, in case the pair of R^1
and R^2 or R^3 and R^4 does not form an alkylidene radical and in
case R^1 and R^3 or R^2 and R^4 are not fused together to form an
endocyclic double bond.

19. (New) The random copolymer as claimed in claim 17,
wherein the structural unit(s) originated from one or more α-
olefins (A1) comprise at least a structural unit originated from
ethylene in which the mole ratio of (the structural unit
originated from ethylene) versus (the structural unit(s)
originated from other α-olefin(s) having 3 or more carbon atoms)
is in the range of from 100/0 to 1/99.

20. (New) The random copolymer as claimed in claim 18,
wherein the structural unit(s) originated from one or more α-
olefins (A1) comprise at least a structural unit originated from
ethylene in which the mole ratio of (the structural unit

originated from ethylene) versus (the structural unit(s) originated from other α-olefin(s) having 3 or more carbon atoms) is in the range of from 100/0 to 1/99.
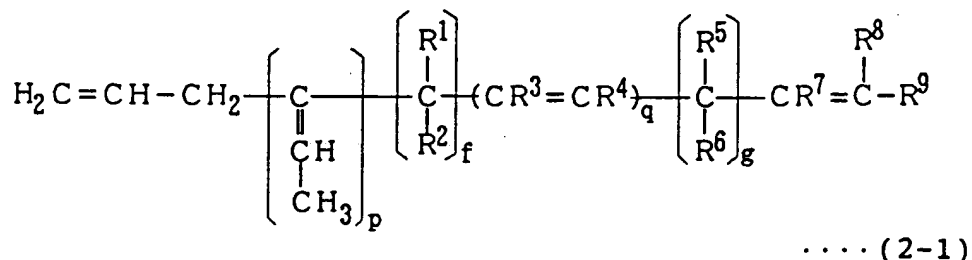
21. (New) The random copolymer as claimed in claim 17, wherein the structural unit(s) originated from one or more α-olefins (A1) comprise at least a structural unit originated from ethylene in which the mole ratio of (the structural unit originated from ethylene) versus (the structural unit(s) originated from other α-olefin(s) having 3 or more carbon atoms) is in the range of from 100/0 to 50/50.

22. (New) The random copolymer as claimed in claim 18, wherein the structural unit(s) originated from one or more α-olefins (A1) comprise at least a structural unit originated from ethylene in which the mole ratio of (the structural unit originated from ethylene) versus (the structural unit(s) originated from other α-olefin(s) having 3 or more carbon atoms) is in the range of from 100/0 to 50/50.
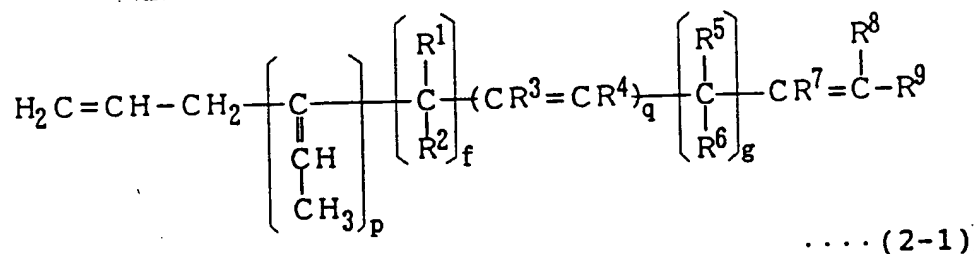
23. (New) The random copolymer as claimed in claim 2, wherein the non-conjugated linear polyene (A3) is represented by the formula (2-1) given below:

$$H_2C=CH-CH_2 \left[\begin{array}{c} C \\ \| \\ CH \\ | \\ CH_3 \end{array} \right]_p \left[\begin{array}{c} R^1 \\ | \\ C \\ | \\ R^2 \end{array} \right]_f (CR^3=CR^4)_q \left[\begin{array}{c} R^5 \\ | \\ C \\ | \\ R^6 \end{array} \right]_g CR^7=\overset{R^8}{\underset{}{C}}-R^9$$

$$\cdots\cdots(2-1)$$

in which p and q is zero or 1 with the proviso that p and q are

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not zero simultaneously, f is an integer of zero to 5 with the
proviso that f is not zero when both p and q are 1, g is an
integer of 1 to 6, R^1, R^2, R^3, R^4, R^5, R^6 and R^7 denote each,
independently of each other, hydrogen atom or an alkyl group
having 1-3 carbon atoms, R^8 denotes an alkyl group having 1-3
carbon atoms and R^9 denotes hydrogen atom, an alkyl group having
1-3 carbon atoms or a group represented by $-(CH_2)n-CR^{10}=C(R^{11})R^{12}$
in which n is an integer of 1 to 5, R^{10} and R^{11} represent each,
independently of each other, hydrogen atom or an alkyl group
having 1-3 carbon atoms and R^{12} represents an alkyl group having
1-3 carbon atoms, with the proviso that R^9 is hydrogen atom or an
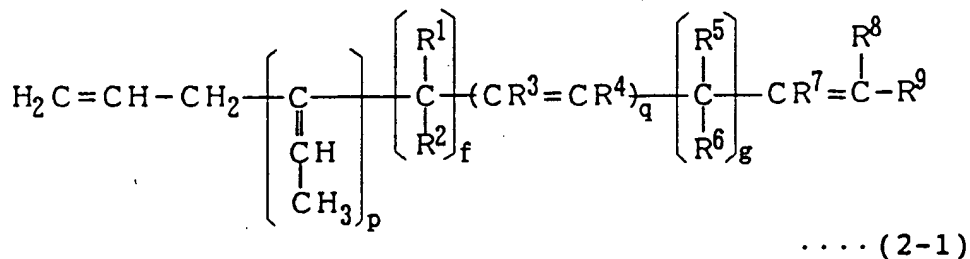alkyl group having 1-3 carbon atoms when both p and q are 1.

24. (New) The random copolymer as claimed in claim 18,
wherein the non-conjugated linear polyene (A3) is represented by
the formula (2-1) given below:

$$\cdots (2\text{-}1)$$

in which p and q is zero or 1 with the proviso that p and q are
not zero simultaneously, f is an integer of zero to 5 with the
proviso that f is not zero when both p and q are 1, g is an
integer of 1 to 6, R^1, R^2, R^3, R^4, R^5, R^6 and R^7 denote each,
independently of each other, hydrogen atom or an alkyl group
having 1-3 carbon atoms, R^8 denotes an alkyl group having 1-3

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carbon atoms and R^9 denotes hydrogen atom, an alkyl group having 1-3 carbon atoms or a group represented by $-(CH_2)n-CR^{10}=C(R^{11})R^{12}$ in which n is an integer of 1 to 5, R^{10} and R^{11} represent each, independently of each other, hydrogen atom or an alkyl group having 1-3 carbon atoms and R^{12} represents an alkyl group having 1-3 carbon atoms, with the proviso that R^9 is hydrogen atom or an alkyl group having 1-3 carbon atoms when both p and q are 1.
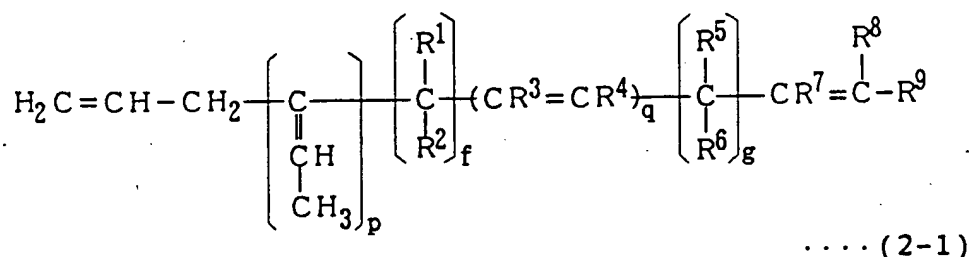
25. (New) The random copolymer as claimed in claim 20, wherein the non-conjugated linear polyene (A3) is represented by the formula (2-1) given below:

$$H_2C=CH-CH_2\left[\begin{array}{c}C\\ \parallel\\ CH\\ \mid\\ CH_3\end{array}\right]_p\left[\begin{array}{c}R^1\\ \mid\\ C\\ \mid\\ R^2\end{array}\right]_f(CR^3=CR^4)_q\left[\begin{array}{c}R^5\\ \mid\\ C\\ \mid\\ R^6\end{array}\right]_g CR^7=\overset{R^8}{\underset{}{C}}-R^9$$

$$\cdots\cdots(2\text{-}1)$$

in which p and q is zero or 1 with the proviso that p and q are not zero simultaneously, f is an integer of zero to 5 with the proviso that f is not zero when both p and q are 1, g is an integer of 1 to 6, R^1, R^2, R^3, R^4, R^5, R^6 and R^7 denote each, independently of each other, hydrogen atom or an alkyl group having 1-3 carbon atoms, R^8 denotes an alkyl group having 1-3 carbon atoms and R^9 denotes hydrogen atom, an alkyl group having 1-3 carbon atoms or a group represented by $-(CH_2)n-CR^{10}=C(R^{11})R^{12}$ in which n is an integer of 1 to 5, R^{10} and R^{11} represent each, independently of each other, hydrogen atom or an alkyl group having 1-3 carbon atoms and R^{12} represents an alkyl group having
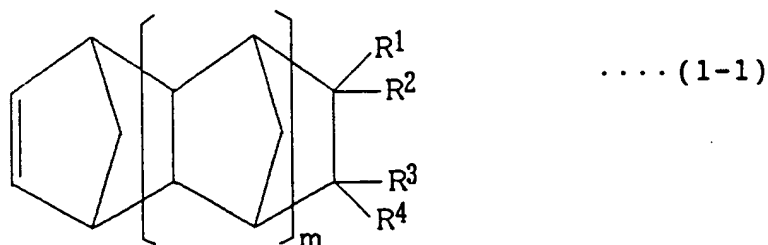
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1-3 carbon atoms, with the proviso that R^9 is hydrogen atom or an alkyl group having 1-3 carbon atoms when both p and q are 1.

26. (New) The random copolymer as claimed in claim 22, wherein the non-conjugated linear polyene (A3) is represented by the formula (2-1) given below:

$$H_2C=CH-CH_2\left[\begin{matrix}C\\\parallel\\CH\\\mid\\CH_3\end{matrix}\right]_p \left[\begin{matrix}R^1\\\mid\\C\\\mid\\R^2\end{matrix}\right]_f (CR^3=CR^4)_q \left[\begin{matrix}R^5\\\mid\\C\\\mid\\R^6\end{matrix}\right]_g CR^7=\overset{R^8}{\underset{R^9}{C}}$$
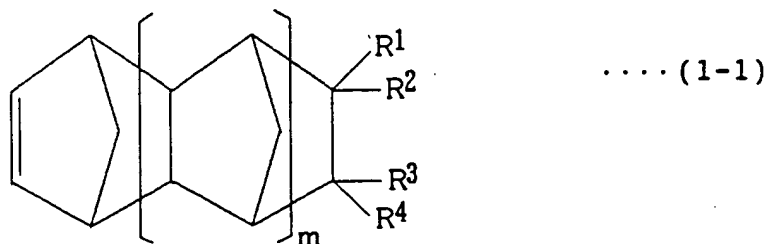
$$\cdots (2-1)$$

in which p and q is zero or 1 with the proviso that p and q are not zero simultaneously, f is an integer of zero to 5 with the proviso that f is not zero when both p and q are 1, g is an integer of 1 to 6, R^1, R^2, R^3, R^4, R^5, R^6 and R^7 denote each, independently of each other, hydrogen atom or an alkyl group having 1-3 carbon atoms, R^8 denotes an alkyl group having 1-3 carbon atoms and R^9 denotes hydrogen atom, an alkyl group having 1-3 carbon atoms or a group represented by $-(CH_2)n-CR^{10}=C(R^{11})R^{12}$ in which n is an integer of 1 to 5, R^{10} and R^{11} represent each, independently of each other, hydrogen atom or an alkyl group having 1-3 carbon atoms and R^{12} represents an alkyl group having 1-3 carbon atoms, with the proviso that R^9 is hydrogen atom or an alkyl group having 1-3 carbon atoms when both p and q are 1.

27. (New) The rubber composition as claimed in claim 7, wherein the non-conjugated cyclic polyene (A2) is that represented by the formula (1-1) given below:

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$$\cdots\cdots (1\text{-}1)$$

in which m is an integer of 0 to 2, R^1 to R^4 denote each,

independently of each other, an atom or a residue selected from

the group consisting of hydrogen atom, halogen atoms and

hydrocarbon residues which may have double bond, wherein R^1 to R^4

may be fused together to form a mono- or polycyclic ring which

may have double bond or wherein an alkylidene radical may be

formed from the pair of R^1 and R^2 or R^3 and R^4 or, further, R^1 and

R^3 or R^2 and R^4 may be fused together so as to form a double bond,

with the proviso that at least one of R^1 to R^4 stands for an

unsaturated hydrocarbon residue having at least one double bond,

in case the mono- or polycyclic ring formed from R^1 to R^4 by

being fused together has no double bond, in case the pair of R^1

and R^2 or R^3 and R^4 does not form an alkylidene radical and in

case R^1 and R^3 or R^2 and R^4 are not fused together to form an

endocyclic double bond.

28. (New) The rubber composition as claimed in claim 8,

wherein the non-conjugated cyclic polyene (A2) is that

represented by the formula (1-1) given below:

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$\cdots (1\text{-}1)$

in which m is an integer of 0 to 2, R^1 to R^4 denote each, independently of each other, an atom or a residue selected from the group consisting of hydrogen atom, halogen atoms and hydrocarbon residues which may have double bond, wherein R^1 to R^4 may be fused together to form a mono- or polycyclic ring which may have double bond or wherein an alkylidene radical may be formed from the pair of R^1 and R^2 or R^3 and R^4 or, further, R^1 and R^3 or R^2 and R^4 may be fused together so as to form a double bond, with the proviso that at least one of R^1 to R^4 stands for an unsaturated hydrocarbon residue having at least one double bond, in case the mono- or polycyclic ring formed from R^1 to R^4 by being fused together has no double bond, in case the pair of R^1 and R^2 or R^3 and R^4 does not form an alkylidene radical and in case R^1 and R^3 or R^2 and R^4 are not fused together to form an endocyclic double bond.

29. (New) The rubber composition as claimed in claim 27, wherein the structural unit(s) originated from one or more α-olefins (A1) in the random copolymer based on non-conjugated cyclic polyene comprise at least a structural unit originated from ethylene, wherein the mole ratio of (the structural unit originated from ethylene) versus (the structural unit(s) originated from other α-olefin(s) having 3 or more carbon atoms)

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is in the range of from 100/0 to 1/99.

30. (New) The rubber composition as claimed in claim 28, wherein the structural unit(s) originated from one or more α-olefins (A1) in the random copolymer based on non-conjugated cyclic polyene comprise at least a structural unit originated from ethylene, wherein the mole ratio of (the structural unit originated from ethylene) versus (the structural unit(s) originated from other α-olefin(s) having 3 or more carbon atoms) is in the range of from 100/0 to 1/99.
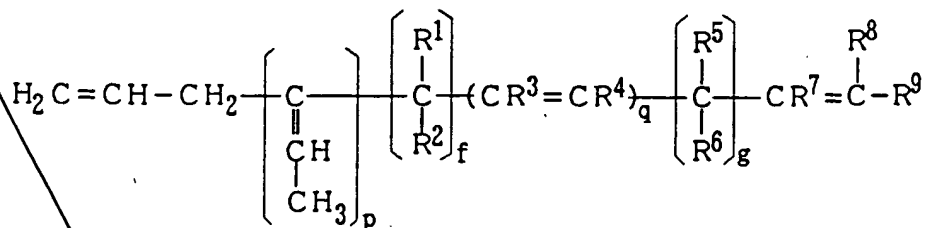
31. (New) The rubber composition as claimed in claim 27, wherein the structural unit(s) originated from one or more α-olefins (A1) in the random copolymer based on non-conjugated cyclic polyene comprise at least a structural unit originated from ethylene, wherein the mole ratio of (the structural unit originated from ethylene) versus (the structural unit(s) originated from other α-olefin(s) having 3 or more carbon atoms) is in the range of from 100/0 to 50/50.

32. (New) The rubber composition as claimed in claim 28, wherein the structural unit(s) originated from one or more α-olefins (A1) in the random copolymer based on non-conjugated cyclic polyene comprise at least a structural unit originated from ethylene, wherein the mole ratio of (the structural unit originated from ethylene) versus (the structural unit(s) originated from other α-olefin(s) having 3 or more carbon atoms) is in the range of from 100/0 to 50/50.
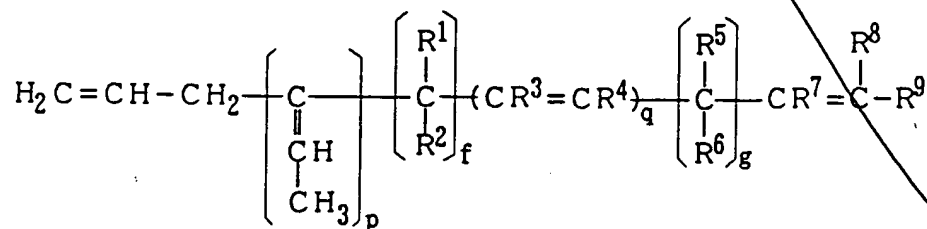
33. (New) The random copolymer as claimed in claim 8,

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wherein the non-conjugated linear polyene (A3) is represented by the formula (2-1) given below:

$$H_2C=CH-CH_2 \left[\begin{matrix} C \\ \| \\ CH \\ | \\ CH_3 \end{matrix} \right]_p \left[\begin{matrix} R^1 \\ | \\ C \\ | \\ R^2 \end{matrix} \right]_f (CR^3=CR^4)_q \left[\begin{matrix} R^5 \\ | \\ C \\ | \\ R^6 \end{matrix} \right]_g CR^7 = \begin{matrix} R^8 \\ | \\ C \end{matrix} -R^9$$

$$\cdots (2\text{-}1)$$

in which p and q is zero or 1 with the proviso that p and q are not zero simultaneously, f is an integer of zero to 5 with the proviso that f is not zero when both p and q are 1, g is an integer of 1 to 6, R^1, R^2, R^3, R^4, R^5, R^6 and R^7 denote each, independently of each other, hydrogen atom or an alkyl group having 1-3 carbon atoms, R^8 denotes an alkyl group having 1-3 carbon atoms and R^9 denotes hydrogen atom, an alkyl group having 1-3 carbon atoms or a group represented by $-(CH_2)n-CR^{10}=C(R^{11})R^{12}$ in which n is an integer of 1 to 5, R^{10} and R^{11} represent each, independently of each other, hydrogen atom or an alkyl group having 1-3 carbon atoms and R^{12} represents an alkyl group having 1-3 carbon atoms, with the proviso that R^9 is hydrogen atom or an alkyl group having 1-3 carbon atoms when both p and q are 1.

34. (New) The random copolymer as claimed in claim 28, wherein the non-conjugated linear polyene (A3) is represented by the formula (2-1) given below:

$$H_2C=CH-CH_2 \left[\begin{matrix} C \\ \| \\ CH \\ | \\ CH_3 \end{matrix} \right]_p \left[\begin{matrix} R^1 \\ | \\ C \\ | \\ R^2 \end{matrix} \right]_f (CR^3=CR^4)_q \left[\begin{matrix} R^5 \\ | \\ C \\ | \\ R^6 \end{matrix} \right]_g CR^7 = \begin{matrix} R^8 \\ | \\ C \end{matrix} -R^9$$

$$\cdots (2\text{-}1)$$

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in which p and q is zero or 1 with the proviso that p and q are not zero simultaneously, f is an integer of zero to 5 with the proviso that f is not zero when both p and q are 1, g is an integer of 1 to 6, R^1, R^2, R^3, R^4, R^5, R^6 and R^7 denote each, independently of each other, hydrogen atom or an alkyl group having 1-3 carbon atoms, R^8 denotes an alkyl group having 1-3 carbon atoms and R^9 denotes hydrogen atom, an alkyl group having 1-3 carbon atoms or a group represented by $-(CH_2)n-CR^{10}=C(R^{11})R^{12}$ in which n is an integer of 1 to 5, R^{10} and R^{11} represent each, independently of each other, hydrogen atom or an alkyl group having 1-3 carbon atoms and R^{12} represents an alkyl group having 1-3 carbon atoms, with the proviso that R^9 is hydrogen atom or an alkyl group having 1-3 carbon atoms when both p and q are 1.
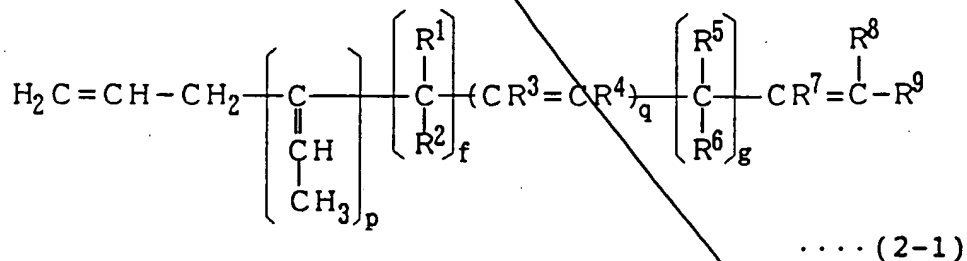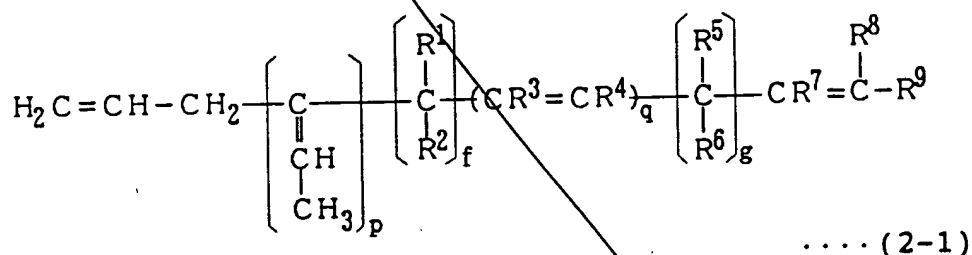
35. (New) The random copolymer as claimed in claim 30, wherein the non-conjugated linear polyene (A3) is represented by the formula (2-1) given below:

$$H_2C=CH-CH_2\left[\begin{array}{c}C\\ \|\\ CH\\ |\\ CH_3\end{array}\right]_p\left[\begin{array}{c}R^1\\ |\\ C\\ |\\ R^2\end{array}\right]_f(CR^3=CR^4)_q\left[\begin{array}{c}R^5\\ |\\ C\\ |\\ R^6\end{array}\right]_g CR^7=\overset{R^8}{\underset{}{C}}-R^9$$

$$\cdots (2-1)$$

in which p and q is zero or 1 with the proviso that p and q are not zero simultaneously, f is an integer of zero to 5 with the proviso that f is not zero when both p and q are 1, g is an

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integer of 1 to 6, R^1, R^2, R^3, R^4, R^5, R^6 and R^7 denote each, independently of each other, hydrogen atom or an alkyl group having 1-3 carbon atoms, R^8 denotes an alkyl group having 1-3 carbon atoms and R^9 denotes hydrogen atom, an alkyl group having 1-3 carbon atoms or a group represented by $-(CH_2)n-CR^{10}=C(R^{11})R^{12}$ in which n is an integer of 1 to 5, R^{10} and R^{11} represent each, independently of each other, hydrogen atom or an alkyl group having 1-3 carbon atoms and R^{12} represents an alkyl group having 1-3 carbon atoms, with the proviso that R^9 is hydrogen atom or an alkyl group having 1-3 carbon atoms when both p and q are 1.

36. (New) The random copolymer as claimed in claim 32, wherein the non-conjugated linear polyene (A3) is represented by the formula (2-1) given below:

$$H_2C=CH-CH_2-\left[\underset{\overset{\displaystyle CH}{\underset{\displaystyle CH_3}{\|}}}{C}\right]_p\left[\underset{\overset{\displaystyle R^1}{\underset{\displaystyle R^2}{|}}}{C}\right]_f(CR^3=CR^4)_q\left[\underset{\overset{\displaystyle R^5}{\underset{\displaystyle R^6}{|}}}{C}\right]_g CR^7=\underset{\overset{\displaystyle R^8}{|}}{C}-R^9$$

$$\cdots(2-1)$$

in which p and q is zero or 1 with the proviso that p and q are not zero simultaneously, f is an integer of zero to 5 with the proviso that f is not zero when both p and q are 1, g is an integer of 1 to 6, R^1, R^2, R^3, R^4, R^5, R^6 and R^7 denote each, independently of each other, hydrogen atom or an alkyl group having 1-3 carbon atoms, R^8 denotes an alkyl group having 1-3 carbon atoms and R^9 denotes hydrogen atom, an alkyl group having 1-3 carbon atoms or a group represented by $-(CH_2)n-CR^{10}=C(R^{11})R^{12}$

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